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Norton Sound Golovin and Moses Point Subdistricts Chum Salmon Stock Status and Action Plan, 2007; a Report to the Alaska Board of Fisheries

by

Jim Menard

and

Daniel J. Bergstrom

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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Jim Menard,
Division of Commercial Fisheries, Nome

and

Daniel J. Bergstrom
Division of Commercial Fisheries, Anchorage

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1599

The Division of Sport Fish Special Publications series was established in 1991 for the publication of techniques and procedures manuals, informational pamphlets, special subject reports to decision-making bodies, symposia and workshop proceedings, application software documentation, in-house lectures, and other documents that do not fit in another publication series of the Division of Sport Fish. Since 2004, the Division of Commercial Fisheries has also used the same Special Publication series. Special Publications are intended for fishery and other technical professionals. Special Publications are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone editorial and peer review.

Jim Menard,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
P. O. Box 1148, Nome, AK 99762, USA
and
Daniel J. Bergstrom
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Road, Anchorage, AK 99518, USA

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ABSTRACT

In response to the guidelines established in the *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222), the Alaska Board of Fisheries (BOF) classified the Norton Sound Golovin and Moses Point Subdistricts (Subdistricts 1 and 2) chum salmon *Oncorhynchus keta* as a stock of concern, specifically a yield concern, at the September 2000 work session. A "yield concern" is defined as, "a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs; a yield concern is less severe than a management concern". An action plan was developed by the Alaska Department of Fish and Game (ADF&G, department) and acted upon by the BOF in January 2001. The SSFP directs ADF&G to assess salmon stocks in areas addressed during the BOF regulatory cycle to identify stocks of concern and in the case of Norton Sound Subdistricts 1 and 2 chum salmon, to reassess the stock of concern status. In 2003, the department recommended continuation of this classification as a stock of yield concern, which was supported by the BOF at its January 2004 meeting. Since that time, chum salmon yield in Subdistricts 1 and 2 has shown little improvement. The Subdistricts 1 and 2 chum salmon stock continues to meet the definition for a yield concern as defined in SSFP. Based on the definitions provided in the SSFP, ADF&G recommends continuing the stock of concern classification of the Subdistricts 1 and 2 chum salmon stock as a yield concern. A review of the existing action plan was conducted, and the department recommends that management through the next board cycle continue under the current plan.

Key words: Norton Sound, chum salmon, *Oncorhynchus keta*, stock of concern, yield concern, commercial fishing, ADF&G, sustainable salmon fisheries policy, Alaska Board of Fisheries.

INTRODUCTION

The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222, effective 2000, amended 2001) directs the Alaska Department of Fish and Game (ADF&G, department) to provide the Alaska Board of Fisheries (BOF) with reports on the status of salmon stocks and identify any salmon stocks that present a concern related to yield, management, or conservation during regular BOF meetings. This report provides ADF&G's reassessment of the Norton Sound Subdistricts 2 and 3 (Golovin and Moses Point) chum salmon stock of concern, which has been classified as a yield concern.

In response to the guidelines established in the SSFP (5 AAC 39.222(f)(42)), the BOF classified the Norton Sound Subdistricts 2 and 3 chum salmon stock as a yield concern at the September 2000 work session. A stock of yield concern is defined as "a concern arising from a chronic inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs; a yield concern is less severe than a management concern" (5 AAC 39.222(f)(42)). The SSFP further goes on to define chronic inability as "the continuing or anticipated inability to meet expected yields over a 4 to 5 year period". This determination as a yield concern was based on low harvest levels for the previous 5-year period (1995–1999) compared to recent historic yields in the 1980s. An action plan was subsequently developed by the department (Bue 2000) and acted upon by the BOF in January 2001. The classification as a yield concern was continued at the January 2004 Board meeting (Menard and Bergstrom 2003).

Based on definitions provided in the SSFP (5 AAC 39.222(f)(42)), only the most recent 5-year yield and escapement history (2002–2006) and the historical level of yield or harvestable surpluses was considered in our current analysis and subsequent recommendations regarding stock of concern status. Accordingly, the department recommended continuation of the Norton Sound Subdistrict 2 and Subdistrict 3 chum salmon stock as a yield concern at the October 2006 BOF work session. From 2002 to 2006, low yields of chum salmon have continued in Norton Sound Subdistrict 2, and in Subdistrict 3, yields have been inconsistent, but often low as well.

STOCK ASSESSMENT BACKGROUND

The Norton Sound District is composed of six commercial fishing subdistricts (Figure 1). Most subdistricts have several rivers where subsistence fishing occurs and, except for Subdistrict 1, there are few restrictions (Kohler et al. 2005). In Subdistrict 2 most freshwater subsistence fishing occurs in the Niukluk and Fish Rivers and, in Subdistrict 3, in the Kwiniuk and Tubutulik Rivers (Figure 2).

ESCAPEMENT

In Subdistrict 2, ADF&G established a threshold sustainable escapement goal (SEG) of 30,000 chum salmon for the Niukluk River tower in 2004. From 2002 though 2006, this SEG was achieved only in 2002, but was within 801 fish of the goal in 2006 (Table 1 and Figure 3). There has been a decreasing trend in escapement since the project was established in 1995, along with drastically reduced commercial and subsistence harvests since 1990 (Figure 4).

In 2001, ADF&G recommended, and later established, chum salmon biological escapement goals (BEG) for the Kwiniuk River of 10,000 to 20,000 chum salmon and 8,000 to 16,000 chum salmon for the Tubutulik River in Subdistrict 3. In January 2001, the BOF established optimum escapement goal (OEG) ranges for chum salmon in Kwiniuk River and Tubutulik River by adding an additional 15% to the BEG range to account for subsistence harvests that may occur above the tower site. Based on escapement counts from the Kwiniuk River counting-tower project, the OEG of 11,500 to 23,000 chum salmon has been achieved in 4 of the 5 recent years (Table 2 and Figure 5). The OEG for the Tubutulik chum salmon stock is 9,200 to 18,400 chum salmon. However, the Tubutulik River chum salmon escapement is assessed via aerial survey. It is difficult to determine if the OEG was achieved in most years because aerial surveys were often incomplete due to poor weather conditions or lack of available aircraft to conduct surveys. Another difficulty in surveying the Tubutulik River, as with many rivers in recent years, is the huge numbers of pink salmon that have been arriving at the same time as chum salmon. Considering the overall poor chum salmon runs to Norton Sound in 2003, the OEG was probably not reached that year. Overall, chum salmon runs in Subdistrict 3 have been lower in the 1990s and 2000s than in the 1980s based on Kwiniuk River escapements and reported harvests (Figures 5 and 6).

YIELD

In Subdistricts 2 and 3, chum salmon harvests in the 2000s have been very minimal. In Subdistrict 2, subsistence salmon harvests taken during the even-numbered years in the 2000s have averaged about twice the average salmon harvest taken during odd years, as fishers take advantage of the greater runs of pink salmon during the even-numbered years (Table 3). Similarly in Subdistrict 3, average even-year salmon subsistence harvests have been nearly four times as great as the average odd-year harvests (Table 4), because of the greater abundance of pink salmon during even years. Since 2001, the commercial market for chum salmon has been very poor. However, in most years the chum salmon runs have been insufficient to allow for a commercial harvest in Subdistricts 2 and 3. Although escapement was well above the threshold for commercial fishing in 2002 in the Kwiniuk River (Subdistrict 3; Figure 5), tendering problems prevented the buyer from purchasing salmon. The chum salmon run in 2003 was very poor and no commercial fishing was allowed in both subdistricts. Since 2003, commercial fishing has not occurred in these two subdistricts due to poor runs, except a surplus of chum salmon available in Subdistrict 3 in 2006 was not harvested commercially because there was no market. Subsistence fishing time was restricted in 2003 and sport fishing for chum salmon was closed in 2004 to conserve chum salmon in Subdistrict 3.

STOCK OF CONCERN RECOMMENDATION

Given the continued low yield of chum salmon despite use of specific management measures, the Norton Sound Subdistricts 2 and 3 chum salmon stock continues to meet the criteria of a stock of yield concern. Therefore, based on the definitions provided in the Policy for the Management of Sustainable Salmon Fisheries 5 AAC 39.222(f)(42), ADF&G recommends continuation of the yield concern classification for the Norton Sound Subdistricts 2 and 3 chum salmon stock.

OUTLOOK

The 2007 chum salmon run in Norton Sound Subdistricts 2 and 3 is expected to be below average based on parent year escapements, and harvests are expected to be well below average because of lack of a commercial buyer. Information from Bering-Aleutian Salmon International Survey (BASIS) studies and trawl bycatch information indicates a high abundance of all salmon species, although not as high for chum salmon as last year. Depending on the origination of these salmon, the 2007 chum salmon run is expected to be less than last year, but sufficient to provide for escapement and subsistence needs. Even with a strong chum salmon run commercial harvests would be dependent on market interest.

ALASKA BOARD OF FISHERIES ACTION

In response to the guidelines established in the Policy for the Management of Sustainable Salmon Fisheries, it is anticipated that the Alaska Board of Fisheries will continue the classification of the Norton Sound Subdistricts 2 and 3 chum salmon stock as a yield concern during the January 31–February 5, 2007 regulatory meeting.

ESCAPEMENT GOAL EVALUATION

The department has undertaken a review of escapement goals for several Norton Sound salmon stocks where long-term escapement, catch, and age composition data exist that enable the development of biological escapement goals (BEG) or sustainable escapement goals (SEG) based on analysis of production consistent with the escapement goal policy.

In Subdistrict 2, the department has established an escapement goal threshold of 30,000 chum salmon for Niukluk River tower in 2004 (ADF&G 2004). In Subdistrict 3, BEGs were established for the Tubutulik and Kwiniuk rivers in 2001 (Clark 2001). Aerial surveys are used to determine if the Tubutulik River goal is reached. A counting tower project is used to estimate chum salmon escapement in Kwiniuk River. In January 2001 the BOF established optimal escapement goal ranges for the Tubutulik and Kwiniuk rivers by increasing the department recommended BEGs by 15%. Escapement goals were reviewed in the 2007 BOF cycle utilizing additional data since the escapement goals were established. This evaluation resulted in no recommended changes (Brannian et al. 2006).

List of current and proposed goals for Golovin and Moses Point chum stocks.

Stream	Current Goal		Proposed Goal
Niukluk River Tower	>30,000	SEG	No Change
Kwiniuk River Tower	10,000–20,000	BEG	No Change
Kwiniuk River Tower	11,500–23,000	OEG	No Change
Tubutulik River Aerial	8,000–16,000	BEG	No Change
Tubutulik River Aerial	9,200–18,400	OEG	No Change

MANAGEMENT ACTION PLAN OPTIONS FOR ADDRESSING STOCKS OF CONCERN AS OUTLINED IN THE SUSTAINABLE SALMON FISHERIES POLICY

NORTON SOUND SUBDISTRICTS 2 AND 3 CHUM SALMON MANAGEMENT PLAN REVIEW/DEVELOPMENT

Current Stock Status

In response to the guidelines established in the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222) the department recommended the continuation of the Norton Sound Subdistricts 2 and 3 chum salmon stock as a yield concern at the October 2006 BOF work session. The BOF, after reviewing stock status information and public input during the January 31–February 5, 2007 regulatory meeting, is anticipated to continue the classification of Subdistricts 2 and 3 chum salmon stock as a yield concern. This determination is anticipated to be based on the inability, despite the use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs during the last 5 years (2002–2006).

Customary and Traditional Use Finding and Amount Necessary for Subsistence Uses

The Alaska Board of Fisheries has made a positive finding for Customary and Traditional Use for salmon in the Norton Sound-Port Clarence Area. Amounts reasonably necessary for subsistence uses has been determined to be 96,000–160,000 salmon for the Norton Sound-Port Clarence Area. Because subsistence fishing restrictions targeting chum salmon stocks has only occurred once (in 2003) during the 2000s in Subdistricts 2 and 3, and because ADF&G is not anticipating the need for restrictions in 2007, it is believed Customary and Traditional Use findings specific to chum salmon are not necessary at this time.

HABITAT FACTORS ADVERSELY AFFECTING CHUM SALMON STOCKS

Subdistrict 2

The Norton Sound/Bering Strait Regional Comprehensive Salmon Plan 1996–2010 briefly mentions that the population of Council, on the Niukluk River was 10,000 people during the Gold Rush (1996, page 45). Damage to fish habitat would have occurred 50 to 100 years ago and is not thought by area staff to be the limiting factor now in chum salmon production. Available spawning habitat appears to be more than adequate for the numbers of fish returning. However, the extent to which mining reduced available spawning and rearing habitat is not known. There is occasional small-scale mining activity on Ophir Creek, which is not now known for chum salmon production. However, oral history indicates Ophir Creek did support much greater numbers of spawning chum salmon prior to mining activities. Historical dredging left numerous dredge ponds, and beaver activity has intensified morphological changes in the creek. The system primarily produces coho salmon now. The increasing presence of beavers appears to be a common agent of habitat change. The Casadepaga River has both small-scale mining and significant chum salmon production. There are likely other systems within the subdistrict that have experienced very small habitat alterations and the cumulative effect of these changes on chum salmon production could be significant.

Subdistrict 3

In the late 1990s there was a perched culvert on Iron Creek on the Moses Point to Elim Road that was a barrier to fish passage (pink, chum, and coho salmon) at all but high tidal stages. Local

residents had manually transported spawning stocks around the culvert in some years. The culvert was initially installed by the Bureau of Indian Affairs and a retrofit has now provided easier fish passage. Beaver dams are becoming more prevalent on Iron Creek and this stream may be transformed from a chum producer to a coho producer. Many hook and line subsistence fishers report harvesting coho salmon from Iron Creek. Kroeker (2006) prepared a report on the effect of beaver activity on Kwiniuk River and Iron Creek.

Projects Needed

A survey of the loss of chum salmon spawning and rearing habitat due to mining in the Niukluk River drainage is needed as is an assessment of the feasibility and cost of restoration.

Do New or Expanding Fisheries on this Stock Exist?

There are no new or expanding fisheries on this stock. However, Norton Sound bound chum salmon are likely caught as bycatch in the Bering Sea groundfish fishery. The chum salmon bycatch greatly increased from 2003 through 2006.

EXISTING MANAGEMENT PLAN

5 AAC 04.390. SUBDISTRICTS 2 AND 3 OF THE NORTON SOUND DISTRICT SALMON MANAGEMENT PLAN.

ACTION PLAN DEVELOPMENT

NORTON SOUND SUBDISTRICTS 2 AND 3 CHUM SALMON ACTION PLAN GOAL

Reduce fishing mortality in order to meet spawning escapement goals, to provide for subsistence levels within the amount reasonably necessary for subsistence uses range, and to reestablish historical range of available harvest for other users.

REVIEW OF MANAGEMENT ACTION PLAN

Regulation Changes Adopted in January 2001

In January 2001, after review of the management action plan options addressing this stock of concern, the BOF adopted the following plan:

> **5 AAC 04.390. SUBDISTRICTS 2 AND 3 OF THE NORTON SOUND DISTRICT SALMON MANAGEMENT PLAN** (a) The purpose of this management plan is to provide the department with management guidelines for the sustained yield of salmon stocks in Subdistricts 2 and 3 in the Norton Sound District. The department shall manage, to the extent practicable, the commercial, sport, subsistence, and personal use fisheries in Subdistricts 2 and 3 to achieve escapement goals.
>
> (b) The department shall manage salmon fisheries in the Subdistricts 2 and 3 as follows:
>
> (1) in the commercial chum salmon fishery,
>
> (A) the department shall manage the fisheries to achieve the following optimal escapement goals ranges:
>
> (i) Kwiniuk River: 11,500–23,000 chum salmon; and
>
> (ii) Tubutulik River: 9,200–18,400 chum salmon;
>
> (B) the chum salmon harvest may not exceed 15,000 fish before the departments mid-July run assessment in Subdistrict 2;

(C) the fishery may occur only if the department projects that chum salmon escapement goals will be achieved and the harvestable surplus will more than meet subsistence needs;

(2) in the commercial pink salmon fishery, the fishery may occur only if subsistence needs are expected to be met and chum salmon escapement goals achieved;

(3) in the commercial coho salmon fishery, the fishery may occur only when the chum salmon escapement goals for the Norton Sound District index rivers specified in 5 AAC 04.358 are achieved or when the department determines that further restrictions would have no impact on achieving chum salmon escapement goals;

(4) the commissioner may not place restrictions on subsistence fishing for chum salmon by emergency order, unless all directed chum salmon commercial fishing has been closed and sport fishing has been appropriately restricted in the subdistrict as provided in 5 AAC 01.180–5 AAC 01.184.

The department was provided the authority to establish subsistence gillnet mesh size restriction of 4½ inches or less by emergency order when necessary to conserve chum salmon in Subdistricts 1, 2, and 3.

The BOF adopted subsistence hook and line attached to a rod or pole as a lawful gear for all species in northern Norton Sound and southern Kotzebue Sound. Sport fishing bag limits and methods and means restrictions were adopted except when a subsistence fishing permit is required, then the catch limits specified in the subsistence fishing permit will apply, except when fishing through the ice.

Regulation Changes Adopted in January 2004

In January 2004, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2003), the BOF adopted a regulation requiring subsistence salmon permits in all waters of Subdistricts 2 and 3. No harvest limits were established for Subdistricts 2 and 3.

Management Review

Historical management actions in Subdistricts 2 and 3 are listed in Table 5. Management strategies employed based on the management action plan adopted by the BOF allowed for commercial chum salmon fishing in 2001. The lower escapement goal range for Kwiniuk River allowed the department to determine earlier in the season that the goal would be reached and therefore allow commercial chum salmon fishing. There was limited fishing effort in both Subdistricts 1 and 2. In 2002, the sole buyer was unable to purchase fish because of mechanical problems with tenders. In Subdistrict 2, the 2002 chum salmon run was poor compared to the runs in 1980s and 1990s. However, in Subdistrict 3, the 2002 chum run was the third best since the 1980s. In 2003, the chum run was poor to both subdistricts and no commercial fishing was allowed. Furthermore, the department closed subsistence fishing for chum salmon for 2 weeks in Subdistrict 2. Telemetry studies on the Fish River drainage from 2002–2004 estimated that approximately one-third of the chum salmon went up the Niukluk River (Todd 2004; Todd et al. 2005). In 2004 and 2005 the chum salmon run was again poor to both subdistricts, but pink salmon runs in both years were near record setting levels in relation to odd-numbered year and even-numbered year historical runs. In 2006, the chum salmon run to Subdistrict 3 rebounded and the escapement was in the top ten historically, but in Subdistrict 2, the chum salmon run continued to be poor.

Subsistence salmon harvests in the 2000s, in Subdistrict 2, have usually been double in even-numbered years compared to odd-numbered years as fishers take advantage of the greater runs of pinks in the even-numbered years. Commercially there has been little interest by buyers in purchasing pink salmon. In 2005, there was a much higher odd-numbered year pink salmon run than in previous odd-numbered years since the tower was established and the pink salmon subsistence harvest was much greater (Table 3). Likewise, in Subdistrict 3, subsistence salmon harvests have usually been nearly four times larger than even-numbered years (Table 4), because of the greater abundance of pink salmon. However, there has been no interest by buyers in purchasing pink salmon since 2000 and in recent years little interest in purchasing chum salmon.

ACTION PLAN ALTERNATIVE

The department believes no new action plans are necessary, and recommends management through the next board cycle continue under current plans.

2007 ALASKA BOARD OF FISHERIES REGULATORY PROPOSALS AFFECTING NORTON SOUND SUBDISTRICTS 2 AND 3 CHUM SALMON

NORTON SOUND - SUBSISTENCE AND SPORT

140 – Clarify permit limits for subsistence gear

148 – Allow cash exchange of subsistence caught fish

NORTON SOUND - COMMERCIAL

149 – Clarify Norton Sound salmon fishing periods

The proposals before the BOF affecting Subdistricts 2 and 3 chum salmon relate to subsistence hook and line methods and means, and bag and possession limits; allowing limited sales of subsistence caught fish; and clarifying commercial fishing periods are established by emergency order rather than weekly fishing schedules.

RESEARCH PLAN

NORTON SOUND INITIATIVE AND AYK SUSTAINABLE SALMON INITIATIVE

A Norton Sound Research and Restoration Initiative (NSI) steering committee was formed that identified and prioritized research needs in response to the low chum salmon run in 1999. Through this initiative, native organizations, private industry, non-profit organizations, state and federal agencies have joined together to form an innovation partnership to cooperatively address salmon research and restoration needs. The NSI projects have been operational since 2001 and completed field work in 2006 and a final report is scheduled to be issued in 2007. The Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative (AYK SSI) was formed after the NSI and is similar in organization, but encompasses the Yukon and Kuskokwim areas in addition to Norton Sound. The AYK SSI has developed an AYK Salmon Research and Restoration Plan designed to identify significant knowledge gaps and establish research priorities that complement other relevant research programs in the region. The AYK SSI is in the process of determining project funding for the 2007 field season.

The NSI has funded many projects occurring in Norton Sound. There were two projects in Subdistricts 2 and 3 that received funding from the NSI throughout the funding period. The

escapement projects on the Niukluk and Kwiniuk Rivers received funding to sample chum salmon for age, sex, and length (ASL) data. These data help managers determine age class return strength, which can improve run projections. Another NSI funded project in Subdistrict 2 used radiotelemetry to track chum salmon tagged in the Fish River several miles downstream of the confluence with the Niukluk River. The telemetry project determines the percentage of chum salmon that spawn in the Niukluk River drainage versus the remainder of the Fish River drainage (Todd 2004; Todd et. al. 2005). Some research projects, although outside of Subdistricts 2 and 3, have provided data that can be useful throughout Norton Sound. One project has shown the outmigration timing of juvenile salmon in Subdistrict 1 was in late July (Nemeth et al. *Unpublished*) as opposed to a belief that outmigration occurred mainly in late June. The NSI also funds one ADF&G research position, stationed in Nome, through June 2007.

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TABLES AND FIGURES

Table 1.–Historical salmon escapements at Niukluk River counting tower, 1995–2006.

Year	Operating Period	Chum	Pink	Chinook	Coho
1995	June 29–September 12	86,333	17,089	123	4,173
1996	June 23–September 12	80,121	1,154,881	237	12,781
1997	June 28–September 9	57,304	10,466	259	3,994
1998	July 4–August 9	45,587	1,624,436	258	839
1999	July 4–September 4	35,240	20,355	40	4,260
2000	July 4–August 27	29,572	961,603	48	11,382
2001	July 10–September 8	30,662	41,625	30	3,468
2002	June 25–September 10	35,307	645,141	621	7,391
2003	June 25–September 10	20,018	75,855	179	1,282
2004	June 25–September 8	10,770	975,895	141	2,064
2005	June 28–September 9	25,598	270,424	41	2,727
2006	June 28–September 8	29,199	1,371,919	39	11,169
	Average 1996–2005 [a]	37,018	578,068	185	5,352

[a] Coho salmon average excludes 1998 because the majority of the run was not counted that year.

Table 2.–Historical salmon escapements at Kwiniuk River counting tower, 1965–2006.

Year [a]	Operating period	Chum	Pink	Chinook	Coho
1965	June 18–July 19	32,861	8,668	19	
1966	June 19–July 28	32,786	10,629	7	
1967	June 18–July 28	26,661	3,587	13	
1968	June 18–July 24	19,976	129,052	27	
1969	June 26–July 26	19,687	56,683	12	
1970	June 25–July 29	66,604	226,831		
1971	June 29–July 29	38,679	16,634		
1972	June 28–July 27	30,686	62,461	65	
1973	June 25–July 25	28,029	37,070	57	
1974	June 20–July 26	35,161	39,375	62	
1975	July 4–July 26	14,049	55,293	44	
1976	July 4–July 25	8,508	35,226	12	
1977	June 26–July 25	21,798	47,934		
1978	July 4–July 22	11,049	70,148		
1979	June 28–July 25	12,355	167,492	107	
1980	June 22–July 28	19,374	319,363	177	
1981	June 19–August 2	34,561	566,417	136	
1982	June 21–July 26	44,036	469,674	138	
1983	June 19–July 27	56,927	251,965	267	
1984	June 19–July 25	54,043	736,544	736[b]	
1985	June 26–July 28	9,013	18,237	955[c]	
1986	June 19–July 26	24,704	241,446	653	
1987	June 25–July 23	16,134	5,567	314	
1988	June18–July 26	13,302	187,991	321	
1989	June 27–July 27	14,282	27,487	248	
1990	June 21–July 25	13,957	416,511	900	
1991	June 18–July 27	19,800	53,499	709	
1992	June 27–July 28	12,077	1,464,717	479	
1993	June 27–July 27	15,823	43,065	594	
1994	June 23–August 9	32,875	2,304,099	625	2,547
1995	June 21–July 26	42,703	17,509	485	114
1996	June 20–July 25	28,493	907,894	577	461
1997	June 18–July 27	20,118	9,536	972	
1998	June 18–July 27	24,248	655,933	302	
1999	June 25–July 28	8,763	608	115	
2000	June 22–July 27	12,878	750,173	144	41
2001	June 27–September 15	16,598	8,423	258	9,532
2002	June 17–September 11	37,995	1,114,410	778	6,459
2003	June 15–September 15	12,123	22,329	744	5,490
2004	June 16–September 14	10,362	3,054,684	663	11,240
2005	June 18–September 12	12,083	341,048	342	12,950
2006	June 22–September 12	39,519	1,347,090	195	22,341
	Average 1965–2005 [c, d]	24,541	364,786	532	9,134

[a] Counts from 1965–1994 taken from the original project reports located in the Nome office of Fish and Game, and counts for 1995–2003 are from Kohler 2003.

[b] Chinook salmon counts from 1965–1984 not expanded.

[c] Chinook salmon counts in 1985 and after were expanded. Chinook salmon average is from 1985–2005.

[d] Coho salmon average is from 2001–2006 as the majority of the run has only been counted since 2001.

Table 3.–Commercial and subsistence salmon catch by species by year in Golovin Subdistrict, Norton Sound District, 1962–2006.

GOLOVIN (SUBDISTRICT 2)																		
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	-	-	-	-	-	-	45	11	264	10,276	68,720	79,316
1963	40	40	-	19,677	49,850	69,607	-	-	118	5,702	9,319	15,139	40	40	118	25,379	59,169	84,746
1964	27	40	3	7,236	58,301	65,607	-	-	-	-	-	-	27	40	3	7,236	58,301	65,607
1965	-	-	-	-	-	-	2	-	49	1,523	3,847	5,421	2	-	49	1,523	3,847	5,421
1966	17	14	584	4,665	29,791	35,071	4	-	176	1,573	3,520	5,273	21	14	760	6,238	33,311	40,344
1967	10	-	747	5,790	31,193	37,740	3	-	185	2,774	4,803	7,765	13	-	932	8,564	35,996	45,505
1968	12	-	205	18,428	10,011	28,656	4	-	181	4,955	1,744	6,884	16	-	386	23,383	11,755	35,540
1969 [a]	28	-	1,224	23,208	20,949	45,409	2	-	190	2,760	2,514	5,466	30	-	1,414	25,968	23,463	50,875
1970 [a]	13	-	3	18,721	20,566	39,303	4	-	353	2,046	2,614	5,017	17	-	356	20,767	23,180	44,320
1971 [a]	37	-	197	2,735	33,824	36,793	7	-	191	1,544	1,936	3,678	44	-	388	4,279	35,760	40,471
1972 [a]	36	-	20	6,562	27,097	33,715	4	-	62	1,735	2,028	3,829	40	-	82	8,297	29,125	37,544
1973 [a]	70	-	183	14,145	41,689	56,087	1	-	48	9	74	132	71	-	231	14,154	41,763	56,219
1974 [a]	30	-	3	28,340	30,173	58,546	3	-	-	967	205	1,175	33	-	3	29,307	30,378	59,721
1975 [a]	17	-	206	10,770	41,761	52,754	-	-	1	2,011	2,025	4,037	17	-	207	12,781	43,786	56,791
1976 [a]	12	-	1,311	24,051	30,219	55,593	-	-	-	1,995	1,128	3,123	12	-	1,311	26,046	31,347	58,716
1977 [a]	26	-	426	7,928	53,912	62,292	3	-	80	703	2,915	3,701	29	-	506	8,631	56,827	65,993
1978 [a]	22	-	94	72,033	41,462	113,611	1	-	-	2,470	1,061	3,532	23	-	94	74,503	42,523	117,143
1979 [a]	75	49	1,606	45,948	30,201	77,879	-	-	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980 [a]	36	36	328	10,774	52,609	63,783	12	-	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981 [a]	23	5	13	49,755	58,323	108,119	8	-	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982 [a]	78	5	4,281	39,510	51,970	95,844	7	-	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	-	-	-	-	-	-	-	-	-	-	-	-
1984	31	-	2,462	88,588	54,153	145,234	-	-	-	-	-	-	-	-	-	-	-	-
1985 [a]	193	113	1,196	3,019	55,781	60,302	12	2	430	1,904	9,577	11,925	205	115	1,626	4,923	65,358	72,227
1986	81	8	958	25,425	69,725	96,197	-	-	-	-	-	-	-	-	-	-	-	-
1987	166	51	2,203	1,579	44,334	48,333	-	-	-	-	-	-	-	-	-	-	-	-
1988	108	921	2,149	31,559	33,348	68,085	-	-	-	-	-	-	-	-	-	-	-	-
1989	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-

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Table 3.–Page 2 of 2.

GOLOVIN (SUBDISTRICT 2)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1990	52	21	0	0	15,993	16,066	-	-	-	-	-	-	-	-	-	-	-	-
1991	49	1	0	0	14,839	14,889	-	-	-	-	-	-	-	-	-	-	-	-
1992	6	9	2,085	0	1,002	3,102	-	-	-	-	-	-	-	-	-	-	-	-
1993	1	4	2	8,480	2,803	11,290	-	-	-	-	-	-	-	-	-	-	-	-
1994 [b]	0	0	3,424	0	111		253	168	733	8,410	1,337	10,901	253	168	4,157	8,410	1,448	10,901
1995 [b]	0	0	1,616	4,296	1,987	7,899	165	34	1,649	7,818	10,373	20,039	165	34	3,265	12,114	12,360	27,938
1996 [b]	0	0	638	0	0	638	86	134	3,014	17,399	2,867	23,500	86	134	3,652	17,399	2,867	24,138
1997 [b]	19	2	102	20	8,003	8,146	138	427	555	4,570	4,891	10,581	157	429	657	4,590	12,894	18,727
1998 [b]	1	0	3	106,761	723	107,488	184	37	1,292	13,340	1,893	16,747	185	37	1,295	120,101	2,616	124,235
1999 [b]	0	0	0	0	0	0	60	48	1,234	469	3,656	5,467	60	48	1,234	469	3,656	5,467
2000 [b]	0	0	1,645	17,408	164	19,217	169	18	2,335	10,906	1,155	14,583	169	18	3,980	28,314	1,319	33,800
2001 [b]	0	43	30	0	7,094	7,167	89	72	880	1,665	3,291	5,997	89	115	910	1,665	10,385	13,164
2002 [b]	0	0	0	0	0	0	69	66	1,640	14,430	1,882	18,087	69	66	1,640	14,430	1,882	18,087
2003 [b]	0	0	0	0	0	0	166	28	309	5,012	1,477	6,992	166	28	309	5,012	1,477	6,992
2004 [c]	0	0	0	0	0	0	164	6	654	19,936	880	21,640	164	6	654	19,936	880	21,640
2005 [c]	0	0	0	0	0	0	96	15	686	11,467	1,852	14,116	96	15	686	11,467	1,852	14,116
2006 [c]	0	0	0	0	0	0	136	36	1,759	14,670	722	17,323	136	36	1,759	14,670	722	17,323
5-year avg. [d]	0	9	6	0	1,419	1,433	117	37	834	10,502	1,876	13,366	117	46	840	10,502	3,295	14,800
10-year avg. [e]	2	5	242	12,419	1,598	14,266	122	85	1,260	9,919	2,384	13,771	124	90	1,502	22,338	3,983	28,037

[a] Subsistence harvests based on household surveys. The number of households surveyed is unknown and varied annually. Actual harvests were greater.

[b] Subsistence harvests based on expanded household survey estimates for Golovin and White Mountain. Harvest numbers do not include other residents outside of subdistrict that fished.

[c] Beginning in 2004 a permit was required for Golovin Subdistrict that replaced household surveys and includes residents outside of subdistrict that fished.

[d] 2001–2005.

[e] 1996–2005.

Table 4.–Commercial and subsistence salmon catch by species, by year in Moses Point Subdistrict, Norton Sound District, 1962–2006.

MOSES POINT (SUBDISTRICT 3)																		
	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1962	27	-	-	11,100	50,683	61,810	-	-	-	-	-	-	-	-	-	-	-	-
1963	15	-	-	2,549	46,274	48,838	5	-	-	5,808	8,316	14,129	20	-	-	8,357	54,590	62,967
1964	32	3	-	3,372	28,568	31,975	-	-	-	63	348	411	-	-	-	3,435	28,916	32,386
1965	-	-	-	-	-	-	16	-	72	1,325	9,857	11,270	-	-	-	-	-	-
1966	17	-	-	2,745	24,741	27,503	14	-	250	2,511	5,409	8,184	31	-	-	5,256	30,150	35,687
1967	-	-	-	-	-	-	39	-	116	1,322	9,913	11,390	-	-	-	-	-	-
1968	12	-	1	9,012	17,908	26,933	2	-	80	6,135	2,527	8,744	14	-	81	15,147	20,435	35,677
1969 [a]	29	-	-	11,807	26,594	38,430	9	-	109	1,790	1,303	3,211	38	-	-	13,597	27,897	41,641
1970 [a]	39	-	-	13,052	29,726	42,817	16	-	160	4,661	6,960	11,797	55	-	-	17,713	36,686	54,614
1971 [a]	95	-	4	922	43,831	44,852	16	-	271	1,046	2,227	3,560	111	-	275	1,968	46,058	48,412
1972 [a]	190	-	11	5,866	30,919	36,986	44	-	108	1,579	2,070	3,801	234	-	119	7,445	32,989	40,787
1973 [a]	134	-	-	10,603	31,389	42,126	2	-	-		298	300	136	-	-	10,603	31,687	42,426
1974 [a]	198	-	9	12,821	55,276	68,304	3	-	-	2,382	1,723	4,108	201	-	-	15,203	56,999	72,412
1975 [a]	16	-	-	4,407	46,699	51,122	2	-	6	1,280	508	1,796	18	-	-	5,687	47,207	52,918
1976 [a]	24	-	232	5,072	10,890	16,218	22	-	-	5,016	1,548	6,586	46	-	-	10,088	12,438	22,804
1977 [a]	96	-	6	9,443	47,455	57,000	22	-	225	1,145	1,170	2,562	118	-	231	10,588	48,625	59,562
1978 [a]	444	-	244	39,694	44,595	84,977	38	-	407	1,995	1,229	3,669	482	-	651	41,689	45,824	88,646
1979 [a]	1,035	-	177	40,811	37,123	79,146	16	-	890	6,078	1,195	8,179	1,051	-	1,067	46,889	38,318	87,325
1980 [a]	502	-	-	1,435	14,755	16,692	131	-	229	4,232	1,393	5,985	633	-	-	5,667	16,148	22,677
1981 [a]	198	-	5	26,417	29,325	55,945	32	-	2,345	6,530	2,819	11,726	230	-	2,350	32,947	32,144	67,671
1982 [a]	253	-	318	9,849	40,030	50,450	1	-	1,835	3,785	3,537	9,158	254	-	2,153	13,634	43,567	59,608
1983	254	-	-	17,027	65,776	83,057	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	5,959	28,035	9,477	43,471	-	-	-	-	-	-	-	-	-	-	-	-
1985 [a]	816	32	1,803	559	24,466	27,676	67	-	1,389	1,212	947	3,615	883	-	3,192	1,771	25,413	31,291
1986	600	41	5,874	15,795	20,668	42,978	-	-	-	-	-	-	-	-	-	-	-	-
1987	907	15	64	568	17,278	18,832	-	-	-	-	-	-	-	-	-	-	-	-
1988	663	93	3,974	13,703	18,585	37,018	-	-	-	-	-	-	-	-	-	-	-	-
1989	62	0	0	0	167	229	-	-	-	-	-	-	-	-	-	-	-	-

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Table 4.–Page 2 of 2.

MOSES POINT (SUBDISTRICT 3)

	Commercial						Subsistence						Combined					
Year	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total	Chinook	Sockeye	Coho	Pink	Chum	Total
1990	202	0	0	501	3,723	4,426	-	-	-	-	-	-	-	-	-	-	-	-
1991	161	0	0	0	804	965	312	-	2,153	3,555	2,660	8,680	473	-	2,153	3,555	3,464	9,645
1992	0	0	3,531	0	6	3,537	100	-	1,281	6,152	1,260	8,793	100	-	4,812	6,152	1,266	12,330
1993	3	0	4,065	0	167	4,235	368	-	1,217	1,726	1,635	4,946	371	-	5,282	1,726	1,802	9,181
1994 [b]	0	0	5,345	0	414	5,759	322	104	1,180	9,345	3,476	14,427	322	104	6,525	9,345	3,890	20,186
1995 [b]	4	44	3,742	2,962	1,171	7,923	284	17	1,353	2,046	3,774	7,474	288	61	5,095	5,008	4,945	15,397
1996 [b]	0	0	1,915	68,609	0	70,524	417	52	1,720	9,442	2,319	13,951	417	52	3,635	78,051	2,319	84,475
1997 [b]	844	0	1,409	0	2,683	4,936	619	50	1,213	1,314	2,064	5,261	1,463	50	2,622	1,314	4,747	10,197
1998 [b]	105	0	1,462	145,669	2,311	149,547	414	49	1,831	6,891	1,376	10,561	519	49	3,293	152,560	3,687	160,108
1999 [b]	0	0	0	0	0	0	424	13	975	1,564	744	3,720	424	13	975	1,564	744	3,720
2000 [b]	10	0	5,182	46,369	535	52,096	248	46	1,429	5,983	1,173	8,879	258	46	6,611	52,352	1,708	60,975
2001 [b]	7	0	1,696	0	681	2,384	427	70	1,352	1,390	898	4,137	434	70	3,048	1,390	1,579	6,521
2002 [b]	0	0	0	0	0	0	565	14	1,801	8,345	1,451	12,176	565	14	1,801	8,345	1,451	12,176
2003 [b]	0	0	0	0	0	0	660	39	1,143	2,524	1,687	6,053	660	39	1,143	2,524	1,687	6,053
2004 [c]	0	0	0	0	0	0	412	0	704	7,858	683	9,657	412	0	704	7,858	683	9,657
2005 [c]	0	0	0	0	0	0	225	9	1,011	3,721	598	5,564	225	9	1,011	3,721	598	5,564
2006 [c]	0	0	0	0	0	0	179	0	1,768	5,104	1,216	8,267	179	0	1,768	5,104	1,216	8,267
5-year avg. [d]	1	0	339	0	136	477	458	26	1,202	4,768	1,063	7,517	459	26	1,541	4,768	1,200	7,994
10-year avg. [e]	97	0	1,166	26,065	621	27,949	441	34	1,318	4,903	1,299	7,996	538	34	2,484	30,968	1,920	35,945

[a] Subsistence harvests based on household surveys. The number of households surveyed is unknown and varied annually. Actual harvests were greater.

[b] Subsistence harvests based on expanded household survey estimates for Elim. Harvest numbers do not include residents outside of Elim that fished in subdistrict.

[c] Beginning in 2004 a permit was required for Moses Point Subdistrict that replaced household surveys and includes residents outside of subdistrict that fished.

[d] 2001–2005.

[e] 1996–2005.

Table 5.–Golovin and Moses Point Subdistricts historical management actions.

1961	-District-wide fishing schedule standard two 48 hour periods per week. -Commercial fishing allowed in marine waters only. -100 fathoms maximum length allowable gear.
1962	Formation of six Management Subdistricts (S.D.).
1969	Beach seines allowed in Golovin S.D. as commercial gear for pink salmon by E.R.
1977	Kwiniuk River escapement goal of 20,000 chum salmon established due to low returns in 1975 and 1976.
1979	Kwiniuk River escapement goal of 25,000 chum salmon established due to low returns in 1975 and 1976 and rebuild the stock.
1980	-Management authority to restrict gillnet mesh size to 4 ½" maximum allowed the ability to open pink salmon directed fishing periods. -Moses Point S.D. periods length reduced to half the standard length.
1985	-Commercial seasons to be opened by Emergency order between June 8 and June 20 and close by Regulation on August 31. -Moses Point S.D. returned to the standard two 48 hour fishing periods per week schedule. -Management closed ½ of Moses Point S.D. due to low chum returns.
1986	Management closed 4 periods in Moses Point S.D. due to low chum returns.
1987	Management closed 5 periods in Moses Point S.D. due to low chum returns.
1988	-Management authority to restrict gillnet mesh size to 6" maximum allowed the ability to direct the fishery toward a target species. -Management restricted the Moses Point S.D. to pink gear only and closed fishing periods to protect the weak chum return.

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1989	Management reduced period length in the Golovin S.D. and closed the Moses Point S.D. during most of the chum run to protect the weak return.
1990	Moses Point S.D. restricted half the season to pink gear during weak chum run.
1991	Moses Point S.D. open only one period during weak chum run.
1992	-Management Plan for the Golovin S.D. established a maximum harvest level of 10,000 chum salmon to preserve the stock and allowed directed fisheries on other species only if survey data indicated adequate chum escapements would likely be achieved. -The Kwiniuk River escapement goal was reduced to 19,500 chum past the counting tower.
1992	-The Moses Point Management Plan allowed only one directed chum commercial period during the anticipated weak chum run.
1993	-Management restricted the Golovin S.D. to special pink salmon periods with limited gear and harvest areas to avoid high incidental catches of chum which could have terminated the pink salmon fishery since the 10,000 chum cap was in effect again. -The Moses Point S.D. did not open for Chinook or pink salmon due to the chance of potentially harvesting a portion of the depressed chum salmon stocks. -Subsistence fishing restrictions were imposed that protected chum salmon on the spawning grounds.
1994	-Golovin S.D. continued 10,000 fish chum salmon cap management plan, but no harvest due to no market. -Moses Point management plan for no directed commercial chum fishery and only allow a pink fishery if adequate chum were available, however no market interest.
1995	No change in management plans in either subdistrict with some chum salmon caught during directed pink and coho fisheries.
1996	No change in management plans in either subdistrict with some chum salmon caught during directed pink and coho fisheries.

-continued-

1997	No change in management plans in either subdistrict with some chum salmon caught during directed king periods except for the Golovin S.D. chum capacity was liberalized to 15,000 fish prior to July 15.
1998	-One commercial king period allowed to offset incidental catches when chum periods were common. -Pink directed period opened continuously with the buyer scheduling fishing to maximize transport and production. Good coho run attracted limited market.
1999	-No commercial periods for any salmon species due to poor returns. -Sport and subsistence coho closures in Golovin Subdistrict.
2000	-Directed pink and coho fisheries land small numbers of chum salmon through use of gear and time restrictions.
2001	-New chum salmon escapement goals established for Kwiniuk River (11,500–23,000) and Tubutulik River (9,200–18,400).
2002	-Lack of buyer results in no commercial fishing. Sport and subsistence restrictions for coho salmon in Golovin Subdistrict. Run determined to be very late and escapement was good.
2003	-No commercial fishing in either Subdistrict because of poor runs. Sport and subsistence restrictions for chum and coho salmon in Golovin Subdistrict.
2004	-Subsistence and sport restrictions on coho salmon. New goal for chum salmon established for Niukluk River tower (SEG 30,000 chums).
2005	-Sport restrictions for coho salmon in Golovin Subdistrict.
2006	-No restrictions.

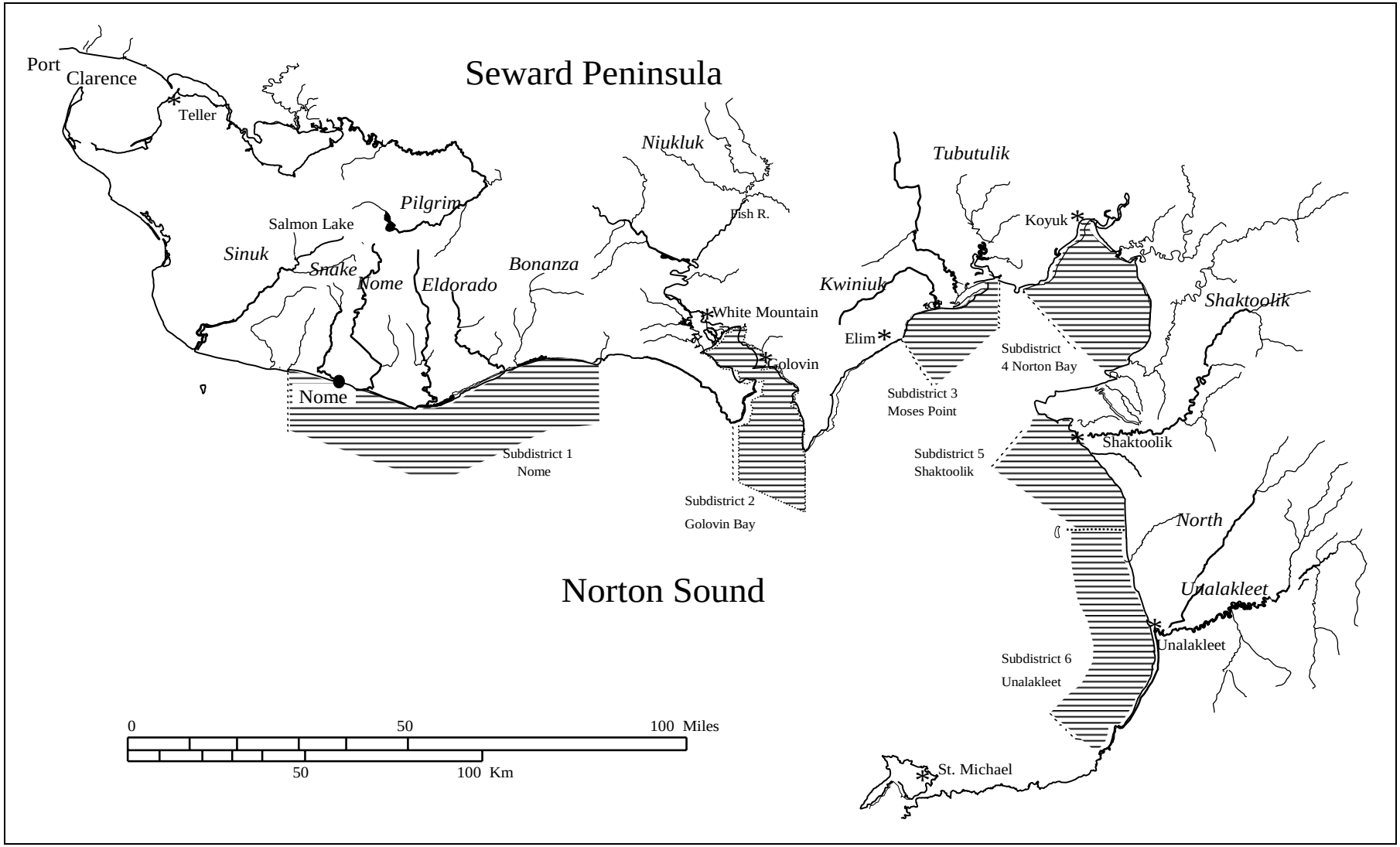


Figure 1.–Norton Sound commercial salmon fishing districts and subdistricts.

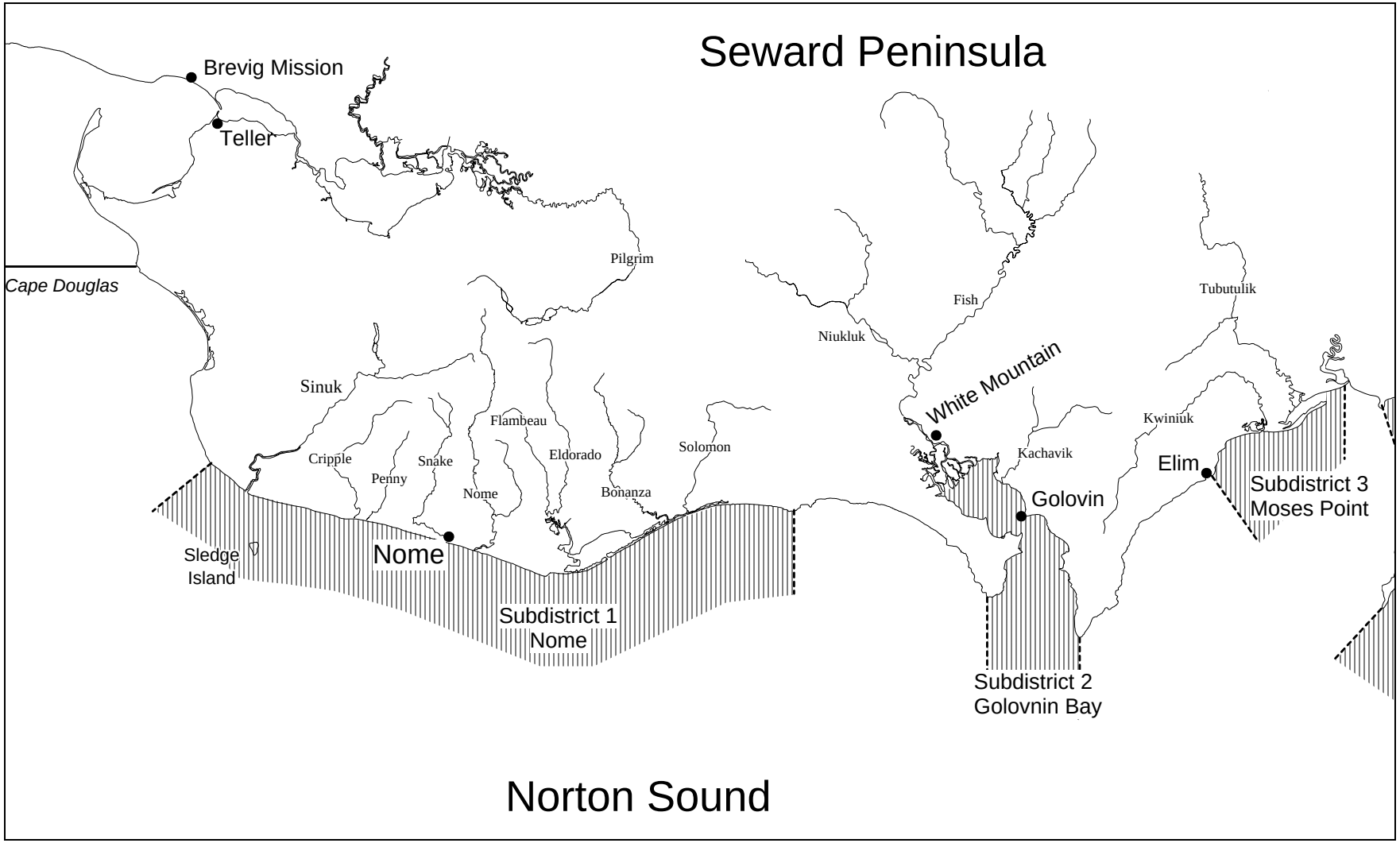


Figure 2.–Northern Norton Sound area rivers.

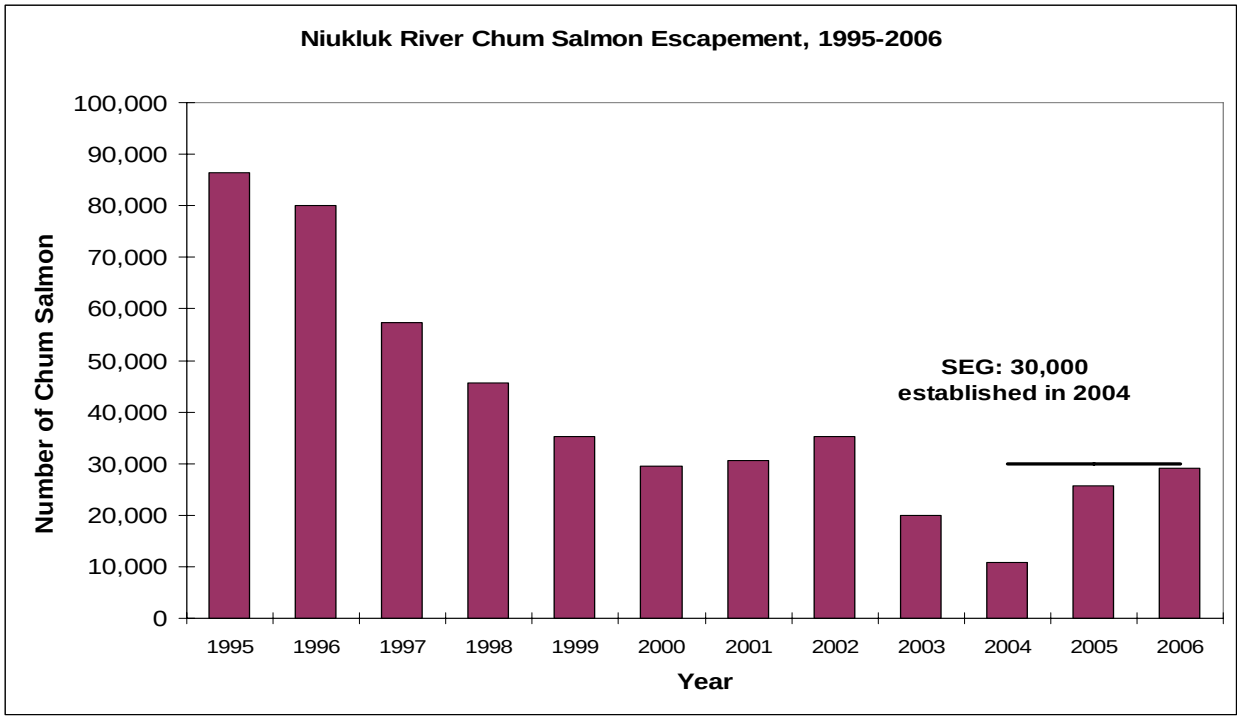
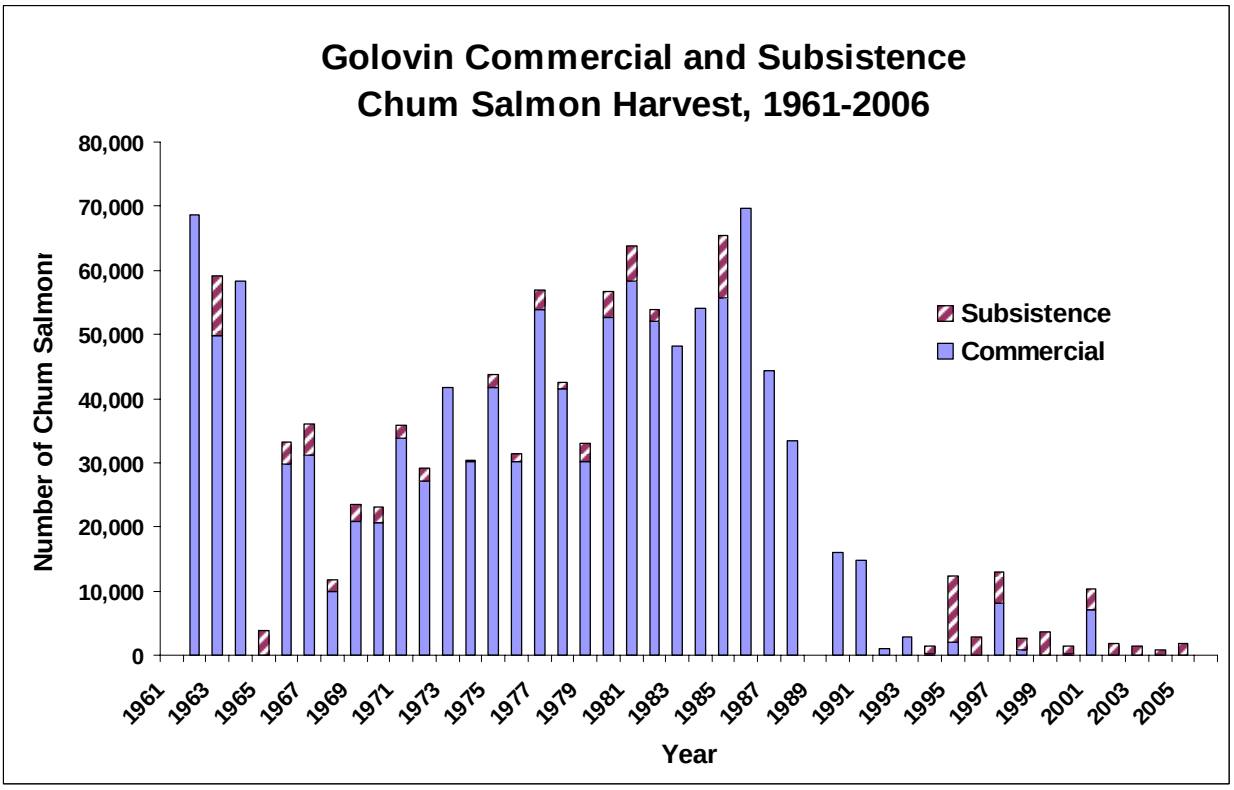


Figure 3.–Niukluk River chum salmon escapement.



Note: Subsistence data not available for all years.

Figure 4.–Golovin Subdistrict chum salmon harvests.

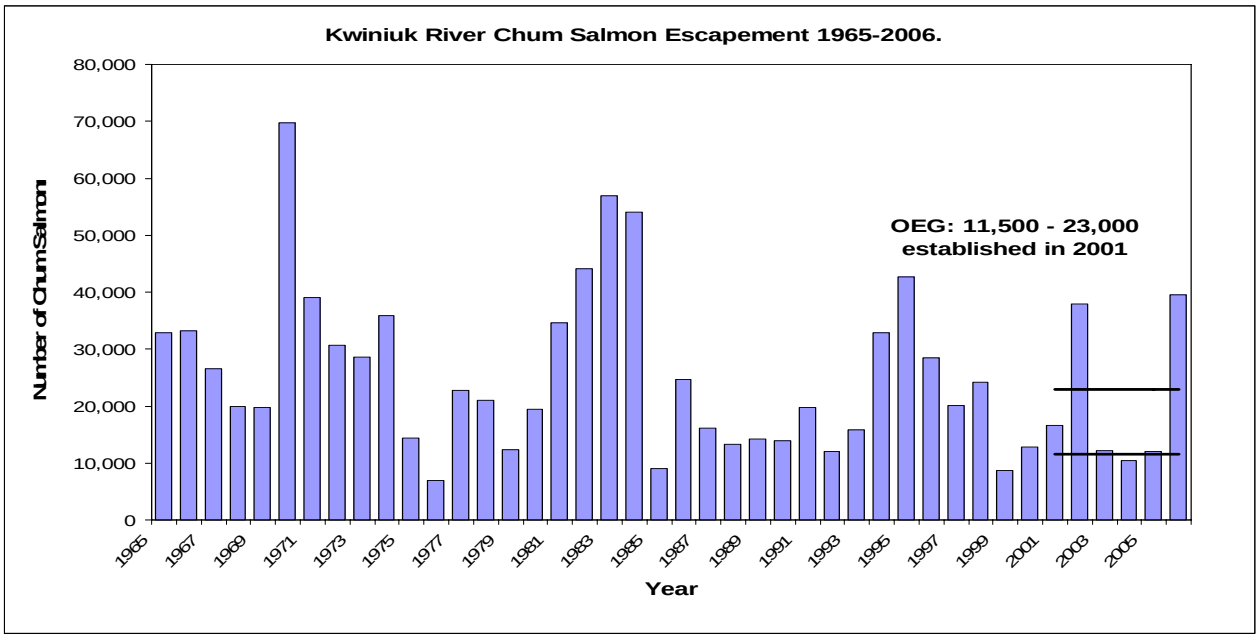
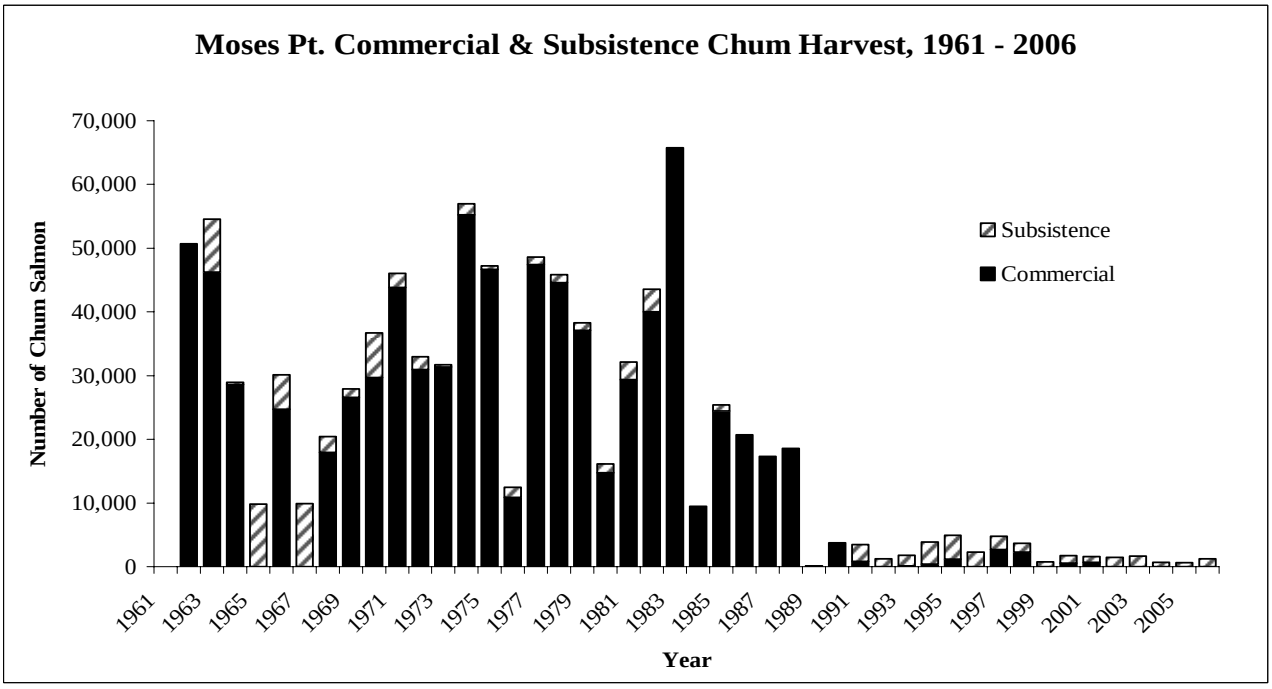


Figure 5.–Kwiniuk River chum salmon escapement.



Note: Subsistence data not available for all years.

Figure 6.–Moses Point Subdistrict chum salmon harvests.